REMARKS

This is in response to the Office Action of January 8, 2003. Applicant thanks Examiner Liang and his Supervisor for their time during the telephone interview of February 4, 2003.

The last paragraph on page 3 of the specification has been amended to correct a minor typographical error.

The drawings were objected to because the reference number 30 had been used to designate both a system and a controller. The specification has been amended so that the reference number 30 refers only to the controller and the reference number 40 refers to the system (see Fig. 3). In the drawings, reference number 30 designates the controller.

Claims 1-3 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,176,184 to Mudry. As discussed during the interview, claim 1 has been amended to state that the controller controls the valves "based on the relative amounts of ink deposited during printing." U.S. Patent No. 6,176,184 to Mudry does not disclose this feature.

Claims 9-15 have been added based on the discussion during the interview. Claim 9 recites "a plurality of plenums associated with the print head." In contrast, Mudry discloses one plenum corresponding to an individual color deck.

Claims 4-5 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,176,184 to Mudry in view of U.S. Patent No. 6,266,079 to Gershony. Gershony is directed to ink printing and not drying and offers no motivation to modify the drying system of Mudry.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Sincerely,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

The last paragraph on page 3 has been replaced with the following new paragraph.

Referring to Figure 1, an ink drying system 10 for high speed printing according to a first embodiment of the present invention is shown. A sheet 12 of material to be imprinted is passed by a printing head 14 in a longitudinal direction of travel, as indicated by the arrow, at speeds which may reach up to about 5 m/s. The printing head 14 can be any device for depositing ink; however, ink-jet printheads are increasingly being used, and the invention is believed to provide its greatest advantages when used in conjunction with ink-jet printing.

The paragraph beginning at page 6, line 23, has been replaced with the following rewritten paragraph:

Turning to Figure 3, a second embodiment 40 of an ink drying system for high speed printing according to the present invention is shown. The system ~~30~~ 40 is similar to the system 10, except that laterally varying drying control is not particularly sought, and instead control is provided in the longitudinal dimension. The orifices 18 of each of the plenums 16 are spaced from one another so as to span entirely the total drying area TDA. The plenums are spaced apart from one another along the longitudinal dimension. Again, each plenum 16 communicates with a source "S" of pressurized gas through a respective fast acting valve 20. In this embodiment, the rate at which drying energy is applied can be tailored to a given laterally extending region of print. Particularly, drying energy is applied to the region by each plenum in succession as the region travels downstream of the printing head. The energy applied to the given region may be tailored with respect to the energy applied to other regions, by cycling the valves 20 so that a desired program of gas flow "follows" movement of the region. For example, supposing there are two plenums 16a and 16b spaced apart from one another along the longitudinal dimension indicated by the arrow. A printing head 14 lays down a laterally extending region of print corresponding to a total drying area "TDA" which travels at the speed of the sheet 12. After having been imprinted, the region TDA arrives at the plenum 16a at a time equal to d_1 divided by

the speed of the sheet, and the fast acting valve 20a is operated to effect a desired flow of the gas therethrough, according to a selected "program" of drying energy for the region TDA. Later, at a time equal to the quantity ($d_1 + d_2$) divided by the speed of the sheet since the region TDA was printed, the region arrives at the plenum 16b, and the fast acting valve 20b is operated according to the same program. The program may provide for identical amounts of drying energy to be provided for the region TDA by each of the plenums, or it may provide for sequential attenuations of the drying energy, corresponding to the respective time delays in reaching the plenums, that take into account anticipated changes in the need for drying energy for drying the region as it moves downstream.-

In the claims:

Claim 1 has been amended as follows:

1. (Amended) An ink drying system for high speed printing on a traveling sheet of material, the system being coupled to a source of pressurized gas and comprising:

a plurality of plenums disposed so as to extend over the sheet, said plenums each including an associated plurality of orifices spaced apart from one another so as to define respective drying portions thereof;

a corresponding plurality of fluid flow valves for controlling fluid communication between said plenums and the source of pressurized gas; and

a controller for controlling said valves based on the amount of ink deposited during printing~~, said controller being adapted to operate said valves independently of one another in response to information about said printing~~.

Claims 9-14 have been added as follows:

9. An ink printing and drying system for high speed printing including a print head for depositing ink on a traveling sheet of material, the system being coupled to a source of pressurized gas and comprising:

a plurality of plenums associated with the print head, said plenums disposed so as to extend over the sheet and each of said plenums including an associated plurality of orifices spaced apart from one another so as to define respective drying portions thereof;

a corresponding plurality of fluid flow valves for controlling fluid communication between said plenums and the source of pressurized gas, one of said plurality of fluid flow valves corresponding to one of said plurality of plenums; and

a controller for controlling said valves, said controller being adapted to operate said valves independently of one another in response to information about said printing.

10. The system of claim 9, wherein said drying portions provide substantially complete laterally extending coverage of the sheet, and wherein the drying portion of at least one of said plenums provides a substantially different range of laterally extending coverage of the sheet than at least one other of said plenums.

11. The system of claim 10, wherein at least two of said plenums are spaced substantially apart from one another in a direction of travel of the sheet by a predetermined distance, and wherein the drying portions of said plenums are each substantially laterally co-extensive.

12. The system of claim 9, wherein a quantity of the ink is defined by a spatially varying distribution, and wherein said controller is adapted, based on said distribution, to select one of said plurality of plenums to receive more of the pressurized gas than at least some of the other of said plenums.

13. The system of claim 10, wherein a quantity of the ink is defined by a spatially varying distribution, and wherein said controller is adapted, based on said distribution, to select one of said plurality of plenums to receive more of the pressurized gas than at least some of the other of said plenums.

14. The system of claim 11, wherein said controller is adapted to select one of said two plenums to receive a first predetermined amount of the pressurized gas at a first time, and to select the other of said two plenums to receive a second predetermined amount of the pressurized gas at a second time, wherein said second amount of the pressurized gas is predetermined based on said first amount, and wherein the difference between said first time and said second time is substantially equal to said distance divided by the speed of travel of the sheet.